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Two New Species of *Lomechusoides* (Coleoptera, Staphylinidae, Aleocharinae, Lomechusini) from Sichuan, China

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Abstract Myrmecophilous staphylinid beetles, *Lomechusoides uenoi* sp. nov. and *L. schneideri* sp. nov., from Sichuan, China, are described. They were collected from nest of *Formica fusca* Linnaeus, 1758 (*F. fusca* group) and *Myrmica* aff. *ruginodis* Nylander, 1846, respectively. This is the first record of *Myrmica* as a host of a member of the genus. *Lomechusoides uenoi* is closely similar to *L. throngensis* (Sawada, 1994), but easily distinguished by the different states of labial palpus, pronotum and aedeagus. *Lomechusoides schneideri* is easily distinguished from the other known species by the long quadrate head. Twelve species formerly placed in *Lomechusa* are newly combined with *Lomechusoides* in Appendix.

Introduction

All the members of the subtribe Lomechusina, to which belongs *Lomechusoides* Tottenham, 1939, are considered to be symphilic myrmecophile highly integrated to ant societies. *Lomechusoides* is represented by 13 species from the Palearctic Region and has been known to be associated with ants of the genus *Formica* Linnaeus, 1758. Seven species of the genus have hitherto been known from East Asia, including the Russian Far East and Siberia. They are: *Lomechusoides amurensis* (Wasmann, 1896), *L. hosodai* (K. Sawada, 1994), *L. minor* (Reitter, 1887), *L. mongolicus* (Wasmann, 1896), *L. sibiricus* (Motschulsky, 1844), *L. strumosus* (Fabricius, 1775), *L. teres* (Eppelsheim, 1886), and only *L. minor* has been known in China. (All the above species except *L. strumosus* were originally described under "*Lomechusa*". They are newly combined with *Lomechusoides* in Appendix. See, Remarks of *Lomechusoides*.)

Recently, we had an opportunity to study two species of the subtribe collected

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from Sichuan, China, through the courtesy of. Mr. Miroslav DVOŘÁK (Prague), Dr. Toshio KISHIMOTO (Japan Wildlife Research Center) and Dr. Shun-Ichi UÉNO (National Science Museum, Tokyo). They were found to be undescribed species, of which the one in DVOŘÁK's collection was collected from an ant nest of the genus *Myrmica* LATREILLE, 1804. This is the first record of *Lomechusoides* species from an ant of the genus *Myrmica* and seems to be remarkable in analysing phylogenetic relationship with *Lomechusa* GRAVENHORST, 1806, of the same subtribe, which is symbiotic with both the genera *Formica* and *Myrmica* and changes the host seasonally. In this paper we are going to describe the two species and to give host records of them.

Methodology and terminology in the present paper follow MARUYAMA *et al.* (2003), and the number of setae and pores not specified is confined to one side of the body.

Taxonomy

Lomechusoides TOTTENHAM, 1939

Lomechusoides TOTTENHAM, 1939, 226. Type species: *Staphylinus strumosus* FABRICIUS, by original designation.

"*Lomechusa*": GANGLBAUER, 1895, 114.—— REITTER, 1909, 41.—— FEYNES, 1920, 302.—— LOHSE, 1973, 227.

Remarks. Most species of *Lomechusoides* were incorrectly described under "*Lomechusa*" due to misidentification of genus. In the meanwhile, most species of *Lomechusa* GRAVENHORST, 1806, were described under the genus *Atemeles* DILLWYN, 1829. TOTTENHAM (1939) pointed it out and established *Lomechusoides* for the species that were formerly described under "*Lomechusa*". However, TOTTENHAM (1939) did not transfer the known species of "*Lomechusa*" to *Lomechusoides*. On the other hand, many articles, including LOHSE (1973), an influential guidebook, and SCHILOW (1981), a revision of the species distributed in the former USSR and the adjacent regions, disregarded his arrangement and continued to use "*Lomechusa*" for *Lomechusoides* species. Therefore, most species of *Lomechusoides* are still placed in "*Lomechusa*". In the check list of the species of the genus in Appendix, 12 species were newly combined with *Lomechusoides*.

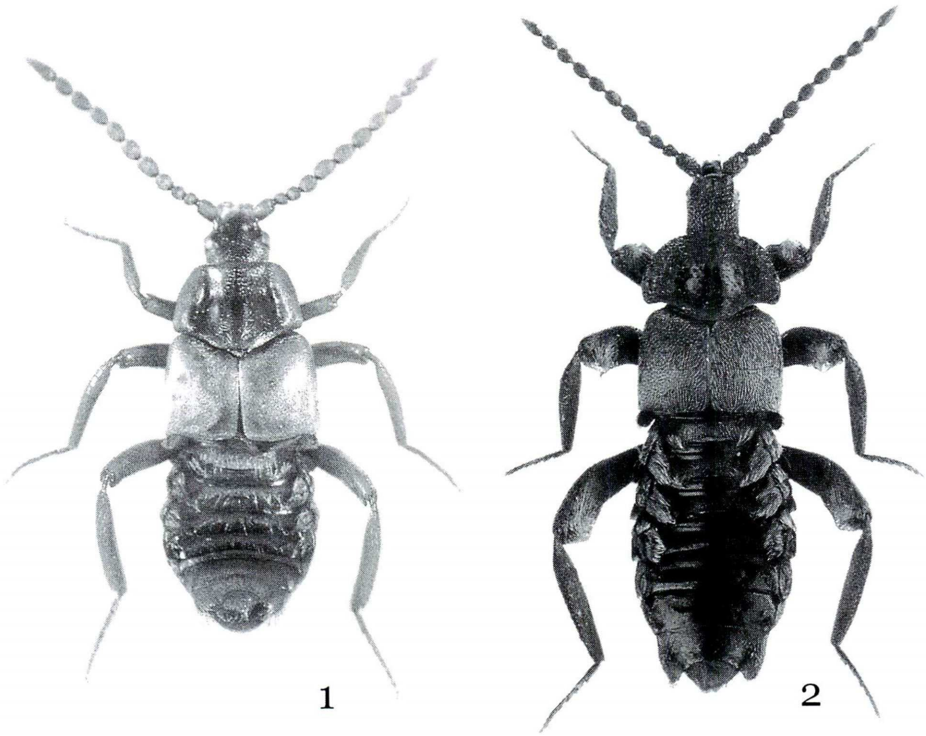
Lomechusoides uenoi MARUYAMA et HLAVÁČ, sp. nov.

(Figs. 1, 3–7)

Type material. Holotype: ♂, "[CHINA: SICHUAN], Kangding, Zheduoshankou, east side (alt. 3,850 m), 9–IX–1998, Shun-Ichi UÉNO leg." From ant nest. Deposited at present in the National Science Museum, Tokyo.

Etymology. Dedicated to Dr. Shun-Ichi UÉNO, who collected the type specimen.

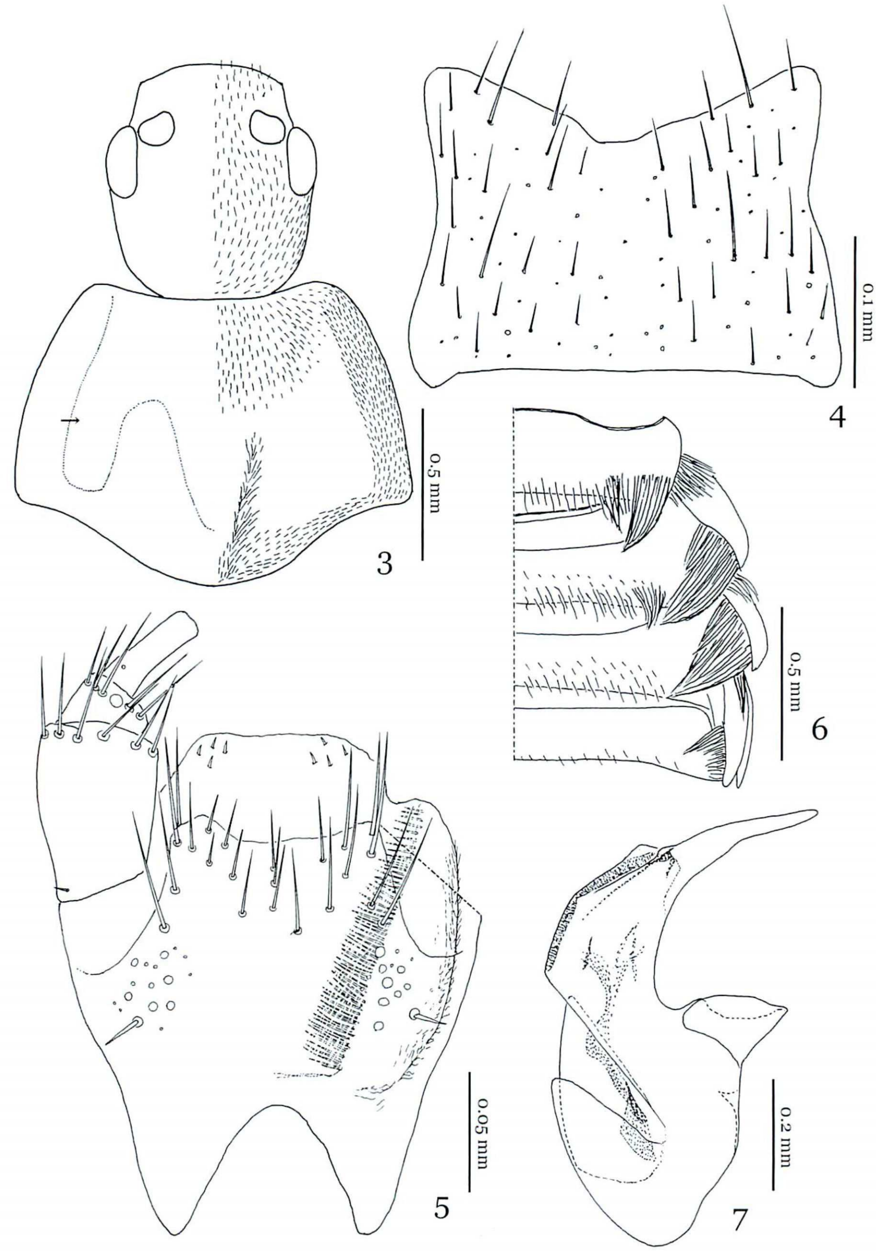
Diagnosis. This species is similar to *Lomechusoides throngensis* (SAWADA, 1994), described from Nepal, in body size, colour and shape of antennae, but is distin-



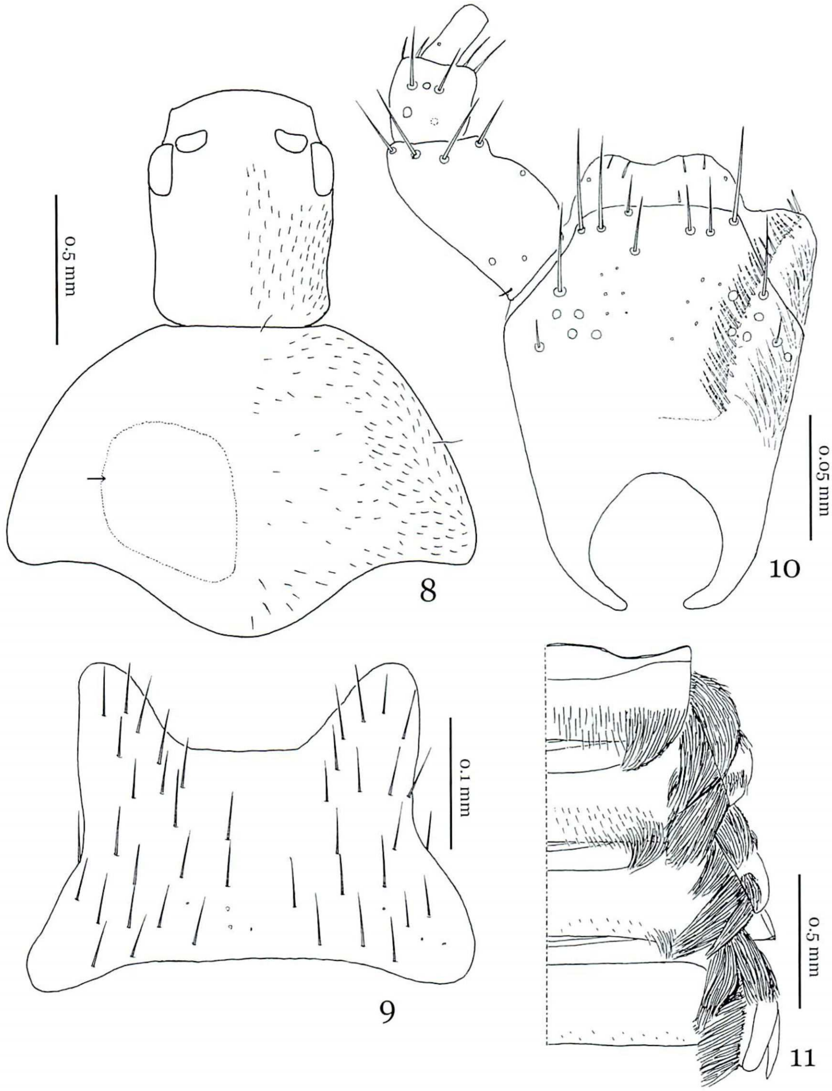
Figs. 1–2. *Lomechusoides* species from Sichuan, China. —— 1. *Lomechusoides uenoi* MARUYAMA et HLAVÁČ, sp. nov. —— 2. *L. schneideri* MARUYAMA et HLAVÁČ, sp. nov.

guished from the latter by the 1st segment of labial palpus longer, the pronotum evidently narrowed apicad, the apical lobe of aedeagus strongly curved ventrad, and the apical lobe of paramerite narrowed apicad.

Description. Body (Fig. 1) yellowish brown in ground colour; head, pronotum, and mesal areas of 3rd to 6th abdominal tergites darker. Head (Figs. 1, 3) somewhat circular, slightly longer than wide (HW/WL=0.9), widest at the middle of eyes; clypeus rounded at apical margin; surface moderately covered with minute setae; length of eyes 0.29 that of head. Mentum (Fig. 4) trapezoidal, 1.3 times as wide as long, deeply emarginate anteriorly, and almost uniformly covered with pseudopores. Prementum (Fig. 5) with one setal pore, real pores and pseudopores poorly differentiated (totally 13–15 in each mesolateral area), 10 setae in anteromesal area. Ligula (Fig. 5) unilobed, with four setulae in each mesolateral area. Labial palpus (Fig. 5) with 1st segment five times as long as 2nd segment. Premental apodeme (Fig. 5) deeply emarginate postero-medially. Antennae (Fig. 1) slightly longer than combined length of head, pronotum and elytra; 1st antennomere large, as long as combined length of 2nd and 3rd; 2nd antennomere half as long as 1st; 3rd antennomere shorter than half of 1st;



Figs. 3–7. *Lomechusoides uenoi* MARUYAMA et HLAVÁČ, sp. nov. —— 3, Fore body, dorsal view; 4, mentum, ventral view; 5, labium, ventral view (labial palpus is omitted and hypopharynx is indicated at the right side); 6, 2nd to 5th abdominal segments, dorsal view; 7, median lobe of male genitalia.



Figs. 8–11. *Lomechusoides schneideri* MARUYAMA et HLAVÁČ, sp. nov. —— 3, Fore body, dorsal view; 4, mentum, ventral view; 5, labium, ventral view (labial palpus is omitted and hypopharynx is indicated at the right side); 6, 2nd to 5th abdominal segments, dorsal view.

5th and 6th antennomeres each longer than one of the 7th to 10th; relative lengths of antennomeres from basal to apical:— 27: 15: 12: 16: 20: 20: 19: 18: 18: 16: 32. Pronotum (Figs. 1, 3) 1.41 times as wide as long; surface densely punctured, densely covered with small and stout setae along margin, with a pair of long-setal band posteromedially; smooth area (Fig. 3: arrow) trilobed. Scutellum pointed posteriorly; surface finely punctured and moderately covered with small setae. Elytra (Fig. 1) wider than long, subparallel-sided, rounded posterolaterally; surface finely punctured and densely covered with setae. Legs (Fig. 1) long, sparsely covered with setae; tibiae curved and constricted at each base; relative lengths of tarsomeres from basal to apical: fore tarsus:— 9: 8: 9: 22; mid tarsus:— 15: 10: 9: 8: 17; hind tarsus:— 19: 14: 13: 11: 22. Abdomen (Figs. 1, 6) foliaceous, widest around 5th segment; 3rd to 5th tergites moderately covered with setae, which become longer toward posterior margin; 6th and 7th tergites nearly devoid of setae; 8th tergite sparsely covered with setae around medial area; trichomes on 2nd to 5th segments as shown in Fig. 6.

Male. Aedeagus (Figs. 7) much narrowed apically and strongly curved ventrad in lateral view; distal crest well developed; apical lobe of paramerite gently narrowed apicad and curved ventrad near apex.

Female unknown.

Measurements. Body length: ca. 4.8 mm; forebody length (from apex of clypeus to apices of elytra): ca. 2.4 mm; head length: 0.76 mm; head width: 0.69 mm; antennal length: 2.69 mm; pronotal length: 0.94 mm; pronotal width: 1.33 mm; elytral length: 1.13 mm; elytral width: 1.70 mm; foretibial length: 0.95 mm; midtibial length: 1.10 mm; hindtibial length; 1.41 mm.

Symbiotic host. Formica fusca LINNAEUS, 1758 (*F. fusca* group), determined by M. M.

Bionomical notes. The type specimen was found in an ant nest under a large flat stone lying in a growth of dwarf rhododendron in the alpine zone of the Zheduo Shan Mountains. There were many similar ant nests on the steep slope above a moraine, but no additional specimens were found after hours of searches. (UÉNO, pers. comm.)

Lomechusoides schneideri MARUYAMA et HLAVÁČ, sp. nov.

(Figs. 2, 8–11)

Type material. Holotype: ♀, "China m., 19–VII–1992, Sichuan, 3,600 m, Kangding env., J. Schneider legit." From ant nest. Deposited at present in the private collection of Mr. Miroslav DVOŘÁK, and eventually in the National Museum, Prague. Spermatheca missing.

Etymology. Dedicated to Mr. Jan SCHNEIDER (Praha), collector of the holotype.

Diagnosis. This species is easily distinguished from the other species of the genus by the long and quadrate head.

Description. Body (Fig. 2) brown in ground colour; head and pronotum darker. Head (Figs. 2, 8) quadrate, long, longer than wide (HW/WL=0.77), widest just before posterior margin; apical margin of clypeus rounded; surface moderately covered with minute setae; length of eyes 0.22 that of head. Mentum (Fig. 9) trapezoidal, 1.4 times as wide as long, deeply emarginate anteriorly, almost uniformly covered with setae except anteromedial area, very sparsely covered with pseudopores near base. Prementum (Fig. 10) with one setal pore, real pores and pseudopores poorly differentiated (totally 10–13 in each mesolateral area), five setae in anteromesal area. Ligula (Fig. 10) weakly bilobed, with two or three setulae and one pore on each lobe. Labial palpus (Fig. 10) with 1st segment 2.5 times as long as 2nd segment. Premental apodeme (Fig. 10) emarginate in a circle postero-medially. Antennae (Fig. 2) almost as long as combined length of head, pronotum and elytra; 1st antennomere large, twice as long as 2nd; 2nd antennomere as long as 3rd; 5th and 7th antennomeres each longer than one of the 8th to 10th; relative lengths of antennomeres from basal to apical:— 30: 15: 15: 17: 19: 19: 19: 17: 17: 16: 28. Pronotum (Figs. 2, 8) 1.46 times as wide as long; surface densely punctured, sparsely covered with long and stout setae, with a pair of round smooth areas (Fig. 8: arrow). Scutellum pointed posteriorly; surface finely punctured and moderately covered with small setae. Elytra (Fig. 2) wider than long, subparallel-sided, rounded posterolaterally; surface finely punctured and densely covered with setae. Legs (Fig. 2) long, densely covered with setae; apical half of femur with a patch of dense and long setae; tibiae flattened, curved and constricted at base, widest at basal 1/5 and gently narrowed apicad, with small interior notch at basal 1/4; relative lengths of tarsomeres from basal to apical: fore tarsus:— 11: 12: 10: 21; mid tarsus:— 16: 15: 13: 11: 20; hind tarsus:— 21: 17: 13: 13: 23. Abdomen (Figs. 2, 11) foliaceous, widest around 4th segment; 3rd tergite moderately covered with setae, which become longer toward posterior and lateral margins; 4th to 8th tergites sparsely covered with setae along posterior margins; trichomes on 2nd to 5th segments as shown in Fig. 11.

Male unknown.

Female. Spermatheca missing in the holotype.

Measurements. Body length: ca. 5.5 mm; forebody length (from front of clypeus to apices of elytra): ca. 2.65 mm; head length: 0.78 mm; head width: 0.60 mm; antennal length: 2.65 mm; pronotal length: 1.03 mm; pronotal width: 1.50 mm; elytral length: 1.15 mm; elytral width: 1.70 mm; foretibial length: 1.08 mm; midtibial length: 1.28 mm; hindtibial length; 1.60 mm.

Symbiotic host. The host ant is most probably *Myrmica ruginodis* NYLANDER, 1846, but somewhat paler in colour. Only one specimen was collected together with the beetle, and it is not sufficient for identifying the species of the difficult genus *Myrmica*. Determined by M. M.

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Scientists (Postdoctoral Fellow) to M. M.

Appendix

A Checklist of the Known Species of *Lomechusoides*

- *Lomechusoides* TOTTENHAM, 1939.
  - *amurensis* (WASMANN, 1896), comb. nov.
    - =*Lomechusa ganglbaueri* BERNHAUER, 1936 (part.)
    - =*Lomechusa suensoni* BERNHAUER, 1936
  - *hosodai* (K. SAWADA, 1994), comb. nov.
  - *inflatus* (ZETTERSTEDT, 1828), comb. nov.
    - =*Lomechusa ganglbaueri* BERNHAUER, 1936 (part.)
    - =*Lomechusa mariae* PALM, 1949
  - *minor* (REITTER, 1887), comb. nov.
  - *mongolicus* (WASMANN, 1896), comb. nov.
  - *schneideri* MARUYAMA et HLAVÁČ, sp. nov.
  - *sibiricus* (MOTSCHULSKY, 1844), comb. nov.
  - *straneoi* (KOCH, 1936), comb. nov.
  - *strumosus* (FABRICIUS, 1775)
    - ssp. *caucasica* (WASMANN, 1896)
    - ssp. *sicula* (FIORI, 1914)
  - *teres* (EPPELSHEIM, 1886), comb. nov.
    - =*Lomechusa wellenii* PALM, 1949
  - *throngensis* (SAWADA, 1994), comb. nov.
  - *turkestanicus* (ROUBAL, 1916), comb. nov.
  - *uenoi* MARUYAMA et HLAVÁČ, sp. nov.
  - *wasmanni* (REITTER, 1918), comb. nov.
  - *zaitzevi* (SCHILOW, 1977), comb. nov.

要 約

丸山 宗利・P. HLAVÁČ：中国四川省産タカネアリノスハネカクシ属（ハネカクシ科ヒゲブトハネカクシ亜科アリノスハネカクシ族）の2新種．—— タカネアリノスハネカクシ属 *Lomechusoides* には，シベリアと極東ロシアを含む東アジアから9種が知られており，中国からは1種のみが記録されていた．筆者らは最近，四川省で採集された2未記載種の標本を検する機会を得たので，*Lomechusoides uenoi* sp. nov., *L. schneideri* sp. nov. として記載する．それぞれ，ヨーロッパクロヤマアリ *Formica fusca*，シワクシケアリの近似種 *Myrmica* aff. *ruginodis* の巣から採集された．本属の種は，ヤマアリ属 *Formica* のアリのみを寄主とすると従来考えられていたが，今回初めてクシケアリ属 *Myrmica* の巣より採集された．近縁属のハケゲアリノスハネカクシ属 *Lomechusa* の種は，ヤマアリ属とクシケアリ属双方のアリを寄主とし，それぞれを季節的に移動することが知られている．今回の発見は，タカネアリノスハネカクシ属とハケゲアリ

ノスハネカクシ属の関係を知るうえで興味深い．*L. uenoi* は *Lomechusoides throngensis* (Sawada, 1994), comb. nov. に似ているが，口器，前胸背板および交尾器の形質状態によって区別できる．*L. schneideri* は方形で長い頭部の形質状態により，他の既知種すべてから容易に区別できる．

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